

Review.

TEXT-BOOK OF EMBRYOLOGY: Vol. I, Invertebrata. By E. W. MACBRIDE, M.A., D.Sc., LL.D., F.R.S., Professor of Zoology at the Imperial College of Science and Technology, South Kensington. (Macmillan & Co., London.)

PROF. MACBRIDE is to be congratulated on having successfully completed a very difficult and laborious task. This volume, which is to be followed by one on the Embryology of the Lower Vertebrata by Prof. Graham Kerr of Glasgow and another on the Embryology of Mammals by Mr. Richard Assheton, gives a comprehensive account of the embryology of the various invertebrate classes. We here find careful and fully illustrated accounts of the most recent and trustworthy descriptions of the growth from the egg of a large series of invertebrate animals. The method adopted by the author is, so far as possible, to select one type in each class, the embryology of which has been fully worked out, and to give full details and ample illustrations taken from the latest sources of information. Then additional diverging histories are given, and, at the close of the larger chapters, the general bearing of the embryological facts upon the ancestral history, and the interpretation of the structural peculiarities of the assemblage of groups dealt with in it, is discussed. The remarkable results of the modern study of cell-lineage in such groups as the Leeches, the Mollusca, the Platyhelminthes and the Annelida are fully set forth and illustrated by first-rate diagrams. Frequent reference is made to the results of experiments on embryonic forms and the artificial interference with their normal growth, and clear accounts of such work are given.

Such a book disarms criticism. It is a fine and successful effort to place the student and investigator of embryology in

possession of the most important facts of his study. At the same time by citation of the titles of original memoirs the reader is enabled to yet further amplify his information.

Modern embryology grew up in the last third of the nineteenth century under the influence of Darwin's theory and the doctrine of "recapitulation" as a new and exciting branch of inquiry. Previously confined to the area of the higher Vertebrata, it was then extended to the whole animal kingdom and by parallel enterprise to the vegetable kingdom also.

Enthusiasts are apt to overlook the fact that such special departments of research do not really form distinct branches of science. Embryology is only the study of morphology, more or less arbitrarily limited to the earlier stages of growth. Just as the description of organic form should be called "morphography" and the word "morphology" applied only to the attempt to account for the facts recorded, so the detailed description of embryonic growth is rather "embryography" than "embryology." In fact, there can be no embryology of animals apart from the "morphology" of animals—of which it is an important and inseparable part. It would, no doubt, be possible to write a treatise considering the facts of growth from the egg from the point of view of morphology. Professor MacBride's treatise aims rather at being a store-house of embryographical fact. Nevertheless he introduces from time to time appropriate morphological disquisitions. We do not complain that these are not longer and more complete, for his main task has been to render accessible to the student a vast and complicated body of embryographical record. We must not expect to find here extended discussions of the morphological significance of the various kinds of renal tubes, of the cœlom and the blood-vascular system, or of the persistence of the blastopore here as anus and there as mouth. Such questions are briefly touched on, but cannot be given the leading place in a treatise planned as this is to place before the reader as much detail as possible of observed fact in all groups of invertebrate animals.

It perhaps follows naturally from the fact that Prof.

MacBride has himself made very important original studies on the development of the Echinoderms, that his chapter on that group is the most original and interesting in the book, though all maintain a high quality of thoroughness and lucidity.

Some of us would perhaps have liked to see something more of a historical method pursued in the exposition of the origin of terms and ideas which are now the commonplaces of embryology. Naturally the older author who first saw and described some important fact is passed over without citation because a worker of a later generation has gone over the same ground and published figures more suitable for reproduction and has, as well, added facts to and corrected errors in the older work. Prof. MacBride is as generous as his space allows him to be to those who set the embryological top spinning. He is necessarily concerned with its present buzz and excursions. Nevertheless a valuable kind of teaching is that which traces out the history of ideas and terms which have become incorporated in a branch of science and are apt to be taken as a matter of course. Kowalewsky, whose discovery of the kinship of Ascidiæ and Vertebrates was reported on forty-five years ago in Vol. X of this *JOURNAL* by Michael Foster, was the founder of modern comparative embryology. Foster had Balfour for his pupil, Balfour taught Sedgwick, and Sedgwick taught MacBride, as his heart-felt dedication of this volume tells. A study of the growth of embryology as associated with these and other names, would be a more valuable training in scientific method for a young student than a knowledge of the innumerable details which the record of embryography comprises. But that does not diminish the value of Prof. MacBride's fine book, nor lessen our indebtedness to him for having produced it.

The other possible treatise, which we should like to see, would correct the erroneous notion, prevalent in this country, that the important advances in embryology, of the last fifty years, have been due to the industrious people (now at war with us) who have worked up details and published the latest

illustrations embalmed in text-books. It is the citation of figures and details from German sources unaccompanied by a careful history of essential ideas and fundamental observations made at an earlier date by English, Russian, and French investigators which does injustice to the latter and makes a new and authoritative history of embryology still necessary.